Indiana University-Purdue University Indianapolis

Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, November 08, 2022
Zoom Meeting: Meeting ID: 845 0989 4694

Speaker: **Maiying Kong**
Department of Bioinformatics and Biostatistics, University of Louisville

Title: **Doubly Robust Methods for Identifying Effect Modifiers and Selecting Optimal Treatment based on Observational Data**

Abstract:

Observational studies differ from experimental studies in that assignment of subjects to treatments is not randomized but rather occurs due to natural mechanisms, where confounding often exists between treatment and outcome. Thus, many statistical methods developed to assess treatment effect and select optimal personalized treatment for experimental studies may not be suitable for observational studies any more. In this article, we propose a flexible semiparametric outcome model to select the optimal treatment regime which is suitable for experimental studies as well as observational studies. The proposed model includes the control group response profile (captured by a non-parametric ensemble method) and the interaction term between treatment and contrast function (i.e., a linear combination of covariates). L_1 regularization is incorporated to select the important variables in the contrast function and improve the accuracy in estimating the contrast function. The proposed approach is quite flexible and has a doubly robust nature, that is, the estimated contrast function is consistent if either the control group response profile or the propensity score model is correctly specified. Extensive simulation studies are carried out to examine the performance of the proposed method. A case study on selecting the optimal treatment to improve the inflammatory biomarker is used to illustrate the application of the proposed method.

Bio:

Dr. Maiying Kong is a full Professor in the Department of Bioinformatics and Biostatistics at University of Louisville. She got her PhD in Statistics from Indiana University at Bloomington in 2004. Dr. Kong's

research interests focus on the study and development of appropriate statistical methods to compare effectiveness of different treatments and procedures based on observational data such as Medicaid data and electronic health record data. She is also interested in the study and development of statistical methods for high dimensional data such as mass spectrometry data, and link them with clinical outcomes.